IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MARYLAND

NATIONAL FAIR HOUSING
ALLIANCE, *et al.*,

    Plaintiffs,

v.

BANK OF AMERICA, N.A., *et al.*,

    Defendants.

Case No.: 1:18-CV-1919

DECLARATION OF PROFESSOR JUSTIN MCCRARY, PH.D.

I, Justin McCrary, hereby declare and state as follows:

1.   I was retained by Defendant Bank of America, N.A. as an expert witness in the above-captioned matter. My experience, qualifications, and opinions are set forth in the expert reports, dated November 5, 2021, and February 14, 2022, which were filed as Exhibits 1 and 2 to BANA's Motion for Dismissal or Other Appropriate Relief Due to the Organizational Plaintiffs' Spoliation of Material Evidence (ECF No. 153).

2.   I make this Declaration based upon my personal knowledge, experience, and expertise, as well as my review of Plaintiffs' Opposition to Defendants' Motion for Dismissal or Other Appropriate Relief Due to the Organizational Plaintiffs' [Alleged] Spoliation of Material Evidence (ECF No. 178) ("Spoliation Opposition"), Ex. 17-A to Plaintiffs' Spoliation Opposition (ECF No. 178-18), and other documents that were provided to me by counsel as identified in my expert reports.

3.   In Plaintiffs' Spoliation Opposition, they acknowledge that Dr. Rugh used different data for the initial set of regressions referenced in the complaint and those regressions

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included in his expert reports. Plaintiffs further acknowledge that these data record different

numbers of total maintenance defects for 116 out of the 899 properties included in both datasets.

As laid out in my supplemental expert report,[1] among the 116 properties with changes, properties

in majority white neighborhoods were changed to have 1.47 fewer deficiencies, on average,

while properties in majority minority neighborhoods were changed to have 0.70 fewer

deficiencies on average. These differences are statistically significant.

      4.   In their Spoliation Opposition, Plaintiffs criticize my calculations, stating, "If Dr.

McCrary's analysis included zeroes for the properties that were unedited, as it should have, his

figures on average changes would be minuscule." I did, however, perform this analysis in

connection with my supplemental report. When I did this analysis, the number of property

maintenance deficiency designations went down between the two versions of the database that I

reviewed, which were produced at RUGH 000013 and PLAINTIFFS 051307. First, when

focusing on the 116 properties with changes, the number of property maintenance deficiency

designations went down by more in majority white neighborhoods than in majority minority

neighborhoods, and this difference is statistically significant (p-value = 0.0122). Next, when

examining all 899 properties, the results are the same: the number of property maintenance

deficiency designations went down by more in majority white neighborhoods than in majority

minority neighborhoods, and this difference is also statistically significant (p-value = 0.0128).[2]

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[1] McCrary Supplemental Report (ECF No. 155-2) ¶ 51.

[2] The 0.0122 p-value was not referenced in my supplemental report but the fact of its statistical significance was; the 0.0128 p-value was reported in the associated workpaper. *See* ECF No. 155-2 at ¶ 51; n. 105 (referencing fn_105_106_workpaper.xlsx, at tab "p-value of differences").

5.   In footnote 15 of the Spoliation Opposition, Plaintiffs also assert that "Dr. McCrary's initial calculation as to the number of entries modified is not limited to substantive edits but includes any edit to the database for that property, including the addition of a photograph or grammatical correction." This assertion misses the mark. No one can know today whether the change was in fact the addition of a photograph or a grammatical correction because the original data was overwritten. It is *possible* that the addition of a photograph or a grammatical correction might be consistent with some data edits. But that possibility does not explain the statistically significant differences in changes to property deficiencies documented above.

6.   In their Spoliation Opposition, Plaintiffs further assert that the missing property inspection reports "would not have aided Defendants' defense" because Plaintiffs' edits to the original data from the reports "tended to shrink the racial gap in deficiencies between the property groups." Plaintiffs base this assertion on their purported "review" of 67 remaining property inspection reports and "corresponding photographs and database records." But the available 67 reports (out of a total of 1,405) provide no reliable or accurate statistical or other basis to support Plaintiffs' assertion. Nor do they invalidate my analysis.

7.   As a fundamental matter, Plaintiffs have not provided the evidence – *i.e.*, the original property inspection reports for all properties – necessary to test their assertion that Plaintiffs' edits to the original data tended to shrink the racial gap in deficiencies. In a reliable methodology of testing for discrimination, as I explained in my reports, the underlying data are sacrosanct and should be maintained so that peers and other reviewers can replicate the findings and assess for themselves whether the results support a given conclusion or assertion. Without the original results from all the missing property inspection reports, or a valid statistical sample

(which Plaintiffs have not provided), it is impossible to know or test the true and full extent of

the later changes Plaintiffs made to those results in the database.

8.   Plaintiffs' purported review of the remaining 67 reports also does not in any way

refute my analysis, discussed above, which analyzed the whole population of 899 available

properties present in both iterations of the regression datasets Plaintiffs produced. That analysis

found statistically significant differences in changes to property deficiencies in the relatively

shorter period, between (a) when Plaintiffs conducted the initial set of regressions referenced in

the complaint and (b) when Dr. Rugh produced his final regression data. In fact, the total deficits

associated with several properties changed between multiple different points in time, including

between the initial property inspection and the filing of the complaint, and again between the

complaint and the dataset I reviewed along with Dr. Rugh's expert report. Several properties

were changed at least twice during this period.[3]

9.   Plaintiffs also cannot reliably or accurately extrapolate their purported findings

from their purported review of 67 remaining property inspection reports to the population of all

properties inspected as a statistical matter. This is because the set of 67 properties constitutes a

non-random sample of properties from areas in two states, New Haven and Hartford,

Connecticut and Dallas-Fort Worth, Texas. This sample is not representative of the 1,405 at-

issue properties, and therefore it is inappropriate for Plaintiffs to draw sweeping inferences or

conclusions about the larger population from this non-random sample. Therefore, as a statistical

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[3] For example, property ID 11576 shows 4 deficiencies in the dataset Plaintiffs created from the handwritten reports, 8 deficiencies in the dataset Plaintiffs relied upon when conducting their initial set of regressions in the complaint, and 3 deficiencies in the dataset Dr. Rugh produced. Property ID 11580 shows 7 deficiencies in the dataset Plaintiffs created from the handwritten reports, 6 deficiencies in the dataset associated with the complaint, and 4 deficiencies in Dr. Rugh's dataset. *See* ECF No. 178-18; PLAINTIFFS 051307.xlsx; RUGH 000013.

matter, Plaintiffs' non-random sample of the 67 remaining property inspection reports is not

sufficient to draw any reliable or accurate conclusion that the review and analysis of the reports

for all 1,405 properties "would not have aided Defendants' defense" (Spoliation Opposition).

10.   Even if one were to *ignore* the non-random nature of Plaintiffs' sample and

analyze their data for the 67 remaining reports, statistical analysis of Plaintiffs' data does not

support Plaintiffs' proffered conclusion that edits "tended to shrink the racial gap in deficiencies

between the property groups." Specifically, Plaintiffs assert that properties in majority minority

neighborhoods were changed to show 1.81 fewer deficiencies, whereas properties in majority

white neighborhoods were changed to show 1.30 fewer deficiencies, implying a difference of

0.51. But the difference in these changes is not statistically significant (p-value = 0.5409),

meaning that one cannot conclude the differences "tended to shrink the racial gap," as Plaintiffs

assert.[4] In fact, the 95 percent confidence interval for this difference is -1.12 (enlarging the

racial gap) to 2.09 (shrinking the racial gap), and therefore includes the real possibility that

Plaintiffs' edits disproportionally enlarged the racial gap.[5] This confidence interval is large due

to Plaintiffs' relatively small sample size ($n = 67$) and high sample variance. As discussed

above, my analysis, based on a sample more than ten times larger ($n = 899$), found that the

direction of Plaintiffs' edits tended to widen the racial gap in maintenance defects in a

statistically significant manner.

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[4] *See* ECF No. 178-18.

[5] The confidence interval, for example, contains the difference in deficit reductions between
properties in majority white and majority minority neighborhoods that I found in my
supplemental expert report (-0.77, including zeroes for the properties that were unedited – *i.e.*,
enlarging the racial gap) using a much larger sample size of 899 properties.
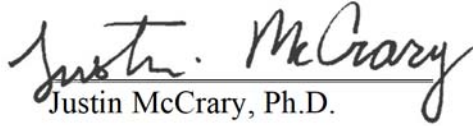
11.   Plaintiffs' use of a non-randomly selected subset of the 1,405 properties to attempt to support their conclusions is akin to researchers overseeing a vaccine trial using a non-random and relatively small subset of 67 patients to test the vaccine's efficacy. It is obvious that using a non-representative and relatively small sample would compromise the results of the trial, in the same way that Plaintiffs' use of a non-representative and relatively small sample here invalidates their conclusions about changes to purported property defects between the original inspection reports and the database.

12.   Plaintiffs' recently produced data also shows that disagreements between property inspectors and Plaintiffs' reviewers (*i.e.*, the NFHA personnel who edited the results from the inspections in Plaintiffs' database) varied systematically across core-based statistical areas ("CBSAs"), providing further evidence that Plaintiffs' survey methodology is unreliable. Plaintiffs' data shows that properties in the Dallas-Fort Worth CBSA had 2.64 edits, on average, between Plaintiffs' initial inspection and the final version of the data, while properties in the New Haven, CT CBSA had an average of 7.33 edits.[6] These differences are highly statistically significant (*p*-value < 0.0001). I found similar and statistically significant differences between Dallas-Fort Worth and the Hartford, CT CBSAs as well.

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[6] *See* ECF No. 178-18; RUGH 000013. I rely on Dr. Rugh's categorization of CBSAs in RUGH 000013 for this analysis.

I declare under the penalties of perjury of the laws of the United States of America that

the foregoing is true and correct to the best of my knowledge, information, and belief.

Executed this 31st day of August, 2022.

Justin McCrary
Justin McCrary, Ph.D.